CLAIMS

1. A signal detection system comprising an electromagnetic signal detector having a limited on-time for detecting receipt of electromagnetic signals, at least two optical paths arranged to receive an electromagnetic signal from the same nominal direction in space and to transmit any received signal towards the signal detector, an optical time delay operative within one of the optical paths to delay transmission of any received signal towards the signal detector, and the optical time delay is selected to extend the operational range of the signal detector by compressing the real time during which a signal can be received into the shorter on-time of the signal detector.

2. A signal detection system, according to Claim 1, in which at least one of the optical paths is arranged to transmit any received signal in real time to the signal detector within its on-time, and the optical time delay is selected to transmit any signal received before real time to the signal detector but within the same on-time.

3. A signal detection system, according to Claim 2, in which a further optical path is arranged to receive an electromagnetic signal from the same nominal direction in space and to transmit the received signal towards the signal detector, a longer optical time delay is operative within the further optical path, and the longer optical time delay is selected to transmit any signal received in a longer period before real time to the signal detector but within the same on-time.

4. A signal detection system, according to any preceding claim, in which each optical path is defined by a separate optical fibre and the optical fibres are closely packed on a focal plane to collect electromagnetic signals from approximately the same nominal direction in space.

5. A signal detection system, according to any of Claims 1 to 4, in which a single optical fibre is positioned to collect electromagnetic signals from the same nominal direction in space, and a signal splitter is arranged to split any collected signal between the optical paths.

6. A signal detection system, according to any preceding claim, in which a lens system is arranged to focus any electromagnetic signal transmitted by the optical paths onto the signal detector.

7. A signal detection system, according to any of Claims 1 to 5, in which a signal combiner is arranged to combine electromagnetic signals transmitted by the optical paths and to transmit the combined signal to the signal detector.

8. A signal detection system, according to any preceding claim, including tagging means arranged to identify which of the optical paths has transmitted an associated portion of the received signal.

9. A signal detection system, according to Claim 8, in which the tagging means comprises a tagger arranged in each of the optical paths and arranged to identify a signal transmitted by that optical path.

10. A signal detection system, according to any of Claims 1 to 9, in which each of the optical paths includes a processing element to process a signal transmitted by that path.

11. A signal detection system, according to any preceding claim, in the form of an active system, in which the optical time delay means are selected to define a series of ranges over which the received signal might have travelled to the signal detection system, and the signal detector is arranged to identify the range of a source of the signal by identifying the optical path through which the signal was transmitted.

12. A signal detection system, according to any of Claims 1 to 11, in the form of a passive system in which the optical time delay means are selected to enable the signal detector during a single on-time to average the value of the electromagnetic signal.

13. A signal detection system, according to any of Claims 1 to 10, in the form of an active system including an electromagnetic energy transmitter, in which the received electromagnetic signal comprises a reflection of part of the electromagnetic energy by an object, and the

optical time delay means are selected to define a series of ranges over which the reflection might have travelled to the signal detection system, and the signal detector is arranged to identify the range of the object by identifying the optical path through which the reflected signal was transmitted.

14. A signal detection system, according to Claim 13, which is mounted for scanning in small increments to receive reflected signal from different directions, the transmitter is arranged to emit multiple bursts of electromagnetic energy to illuminate a volume in space, and the signal detector is arranged to have a series of on-times co-ordinated with the bursts to detect any reflected signal from the object.

15. A signal detection system, according to Claim 13 or 14, comprising a plurality of signal detection systems arranged as a matrix of optical fibres, each pointing in a different nominal direction, to receive reflected signals from the object and the signal detectors are arranged to form an image of the object.

16. A signal detection system, according to Claim 13 or 14, comprising a plurality of signal detection systems arranged as a matrix of optical fibres, each pointing in a different nominal direction, to receive reflected signals, an optical system to focus any reflected electromagnetic signal from the object into the optical paths of the signal detectors, and the signal detectors are arranged to form an image of an object.

17. A method of detecting an electromagnetic signal travelling from a nominal direction in space, comprising splitting the signal into a plurality of paths, delaying the passage of the split signal along some of the paths, and detecting the portion of the signal that leaves each of the paths at substantially the same time.

18. A method, according to Claim 17, including identifying the path through which the signal was received.

19. A method, according to Claim 17 or 18, including averaging the signal leaving the paths.